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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/961,134      | 09/21/2001  | Stan Tsai            | 5262/CMP/CMP/RKK    | 4110             |

32588 7590 08/28/2003

APPLIED MATERIALS, INC.  
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SANTA CLARA, CA 95050

EXAMINER

WONG, EDNA

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|          | 1753         |

DATE MAILED: 08/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                 |              |  |
|------------------------------|-----------------|--------------|--|
| <b>Office Action Summary</b> | Application No. | Applicant(s) |  |
|                              | 09/961,134      | TSAI ET AL.  |  |
|                              | Examiner        | Art Unit     |  |
|                              | Edna Wong       | 1753         |  |

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on \_\_\_\_.

2a) This action is **FINAL**.                            2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-8 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_ is/are allowed.

6) Claim(s) 1-8 is/are rejected.

7) Claim(s) \_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

- Certified copies of the priority documents have been received.
- Certified copies of the priority documents have been received in Application No. \_\_\_\_.
- Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

|  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                      | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____.  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                             | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2,3,4</u> . | 6) <input type="checkbox"/> Other: _____                                    |

***Drawings***

The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81. No new matter may be introduced in the required drawing.

***Specification***

The disclosure is objected to because of the following informalities:  
page 6, line 6, the word -- not -- should be inserted after the word "is" (first occurrence).

page 11, line 17, it is unclear what is meant by "0.1 phi".

Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Rejections - 35 USC § 112***

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite

for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4

line 2, it is unclear what is meant by "0.1 phi".

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-3, 5-6 and 8** are rejected under 35 U.S.C. 102(b) as being anticipated by **Ashjaee et al.** (US Patent Application Publication No. 2003/0029731 A1).

Ashjaee teaches a method of forming a metal layer on a substrate, comprising the steps of:

- (a) providing a substrate **16** to an electroplating cell **9c**, wherein the electroplating cell has a porous pad **8** and an electrolyte solution **9a** therein;
- (b) contacting portions of the substrate to the porous pad (= the pad **8** and the wafer surface **22** touch each other) [page 3, ¶ [0039]; and Fig. 4]; and
- (c) forming a metal layer onto the substrate, wherein the metal layer is formed on the substrate by alternately applying a first electrical potential and a second electrical potential to the electrolyte solution, and wherein the first electrical potential deposits

metal on the substrate while the second electrical potential removes metal from the contacted portions of the substrate (page 1, ¶ [0011]; and page 4, ¶ [0046]).

The substrate and the porous pad move relative to one another during metal layer formation (page 1, ¶ [0011]; and page 3, ¶ [0040]).

The metal layer comprises copper (Cu) [page 4, ¶ [0046]].

The electrolyte solution comprises metallic species (= copper) [page 4, ¶ [0046]].

The first electrical potential has an opposite polarity from that of the second electrical potential (= the potential has a first polarity which produces deposition of the conductive material on the wafer frontal side and a second potential having a *reversed polarity* to remove conductive material) [page 1, ¶ [0011]].

Either of the first electrical potential and the second electrical potential are alternately applied to the electrolyte solution for differing time periods (= copper may be plated or removed from the wafer. Circuitry is used for the application and adjustment of the applied potential and for inverting the polarity of the potential) [page 3, ¶ [0041]].

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over

as applied to claims 1-3, 5-6 and 8 above.

Ashjaee is as applied above and incorporated herein.

Ashjaee does not teach wherein the porous pad contacts portions of the substrate with a pressure in a range of about 0.1 phi and about 5 psi; and wherein either of the first electrical potential and the second electrical potential are alternately applied to the electroplating cell within a range of about -5 volts to about 5 volts.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one skilled in the art would have been motivated to have modified the method of Ashjaee with wherein the porous pad contacts portions of the substrate with a pressure in a range of about 0.1 phi and about 5 psi because the pressure is a result-effective variable and one skilled in the art has the skill to calculate the pressure that would determine the success of the desired reaction to occur, e.g., one can achieve just plating or plating and polishing (page 3, ¶ [0039]). absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

Furthermore, Ashjaee teaches that when the wafer surface and the pad are touching, the pressure that is exerted on the wafer and pad surfaces can also be adjusted (page 3, ¶ [0036]).

As to wherein either of the first electrical potential and the second electrical

potential are alternately applied to the electroplating cell within a range of about -5 volts to about 5 volts, Ashjaee teaches that the circuitry used for the application and adjustment of the applied potential and for inverting the polarity of the potential is well known and commonly used (page 3, ¶ [0041]). Thus, the range is a result-effective variable and one skilled in the art has the skill to calculate the range that would determine the success of the desired reaction to occur, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

### ***Citations***

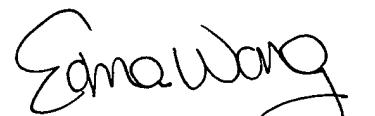
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

**Talieh** (US 6,402,925 B2) is cited to teach a method for electrochemical mechanical deposition comprising the step of providing a second potential difference having a polarity that is opposite the first potential difference between the workpiece and the electrode such that some of the applied conductive material is removed (col. 7, lines 8-13).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (703) 308-3818. The examiner can normally be reached on Mon-Fri 7:30 am to 5:00 pm, alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1495.



Edna Wong  
Primary Examiner  
Art Unit 1753

EW  
August 22, 2003